Products of the Chlorine Tree

Chlorine is one of the most abundant naturally occurring chemical elements. It also plays an important and significant role in the manufacture of thousands of products we depend on every day.

- Audiotapes
- Bedding – pillows, mattress covers, sheets, blankets, bed spreads, towels
- Boat hulls and automotive parts
- Coats and jackets
- Draperies and curtains
- Fire hose jackets
- Jeans and tee shirts
- Packaging
- Pants and shorts
- Reinforcement for rubber hose
- Shirts
- Sweaters
- Tablecloths
- Tents and awnings
- Textile fabrics (often combined with wool and other fibers such as knits, terry, denim, velour, chenille, seersucker and poplin)
- Tire fabric and seat belts
- Upholstery (sofas and chairs)
- Videotapes

- ABS Plastics – telephones
- Acrylic fibers – blankets, carpets, fabrics
- Boats
- Housing for tools, machinery, business machines, radios, tape players, cameras and household appliances
- Luggage
- Nitrile rubber
- Shower stalls

- Polyester
- Antifreeze
- Acrylonitrile
- Ethylene glycol
- Ethylene oxide

- Artificial turf
- Automotive upholstery
- Bristles for toothbrushes, hairbrushes, paintbrushes, carpets and rugs
- Cordage, towlines and rope
- Fishing boots, nets and line
- Flotation vests for boating
- Furniture fabrics
- Gears and bearings
- Guitar strings
- Jogging shoes and sneakers
- Parachutes
- Pen tips
- Sails
- Sleeping bags and camping equipment
- Surgical sutures
- Tarpaulins, canopies and awnings
- Tennis racquet strings
- Tents
- Tire cord
- Wearing apparel – shirts, blouses, lingerie, hosiery, jackets and swim wear
- Window screens
- Wire insulation

Nylon ← Adiponitrile ← 1,4-DICHLOROBUTANE

- Bandages
- Crop protection chemicals
- Dyes
- Erasers
- Oil additives
- Pacemaker batteries
- Photographic chemicals
- Purifying sugar juices
- Rubber antioxidants

SULFUR DICHLORIDE
SULFUR MONOCHLORIDE
THIONYL CHLORIDE
SULFURYL CHLORIDE

- Detergents for automatic dishwashers
- Household and commercial bleaches
- Sanitizers for swimming pools
- Scouring powder

CHLORINATED ISOCYANURATES

- Bleaching pulp, paper and textiles
- Disinfectant for swimming pools
- Household bleach
- Pharmaceuticals
- Water purification

SODIUM HYPOCHLORITE

- Bristles for brushes
- Fibers
- Latex coatings
- Multiwall paper bags
- Packagings for food products (meats and poultry)
- Pipe and fittings for hot corrosive materials
- Seat covers
- Upholstery

Polyvinylidene chloride → VINYLIDENE CHLORIDE

- Pulp and paper
- Water treatment

ALUMINIUM CHLORIDE

- Catalyst
- Corrosion resistant paint
- Electrical components
- Pigment
- Semiconductors
- Synthetic gemstones

TITANIUM DIOXIDE

- Adhesives
- Circuit boards
- Crop protection chemicals
- Degreaser
- Drain cleaners
- Dry cleaning
- Dyes

- Leather finishing
- Paper deinker
- Pigments
- Refrigerants
- Solvents
- Spot remover
- Textile manufacture
- Transformer fluid

PERCHLOROETHYLENE
TRICHLOROETHYLENE

- Pulp and paper bleaching
- Pool disinfectants
- Water treatment

CHLORINE DIOXIDE

- Brewing
- Corn syrup
- Gelatin
- Monosodium Glutamate
- Sugar refining

Food processing

HYDROCHLORIC ACID

- Alloys
- Photoflash bulbs
- Pyrotechnics
- Refractories

Production of metallic chlorides

- Electronic silicone
- Silicone resins and elastomers

Production of alkyl chlorides

- Batteries
- Pharmaceuticals
- Plastics stabilizer
- Rocket propellants
- Rubber accelerator

Production of hydrochlorides

- Desulfurization agent for petroleum
- Oil well acidifying
- Pickling in steel manufacture
- Latex coagulating agent
- Sanitation

- Flame retardant for plastics

TETRACHLOROPHTHALIC ANHYDRIDE

- Liniments and pharmaceuticals

TRICHLOROACETALDEHYDE

- Crop protection chemicals

CHLOROPHENOLS

- Silvering mirrors
- Stabilizer for perfume in soaps

STANNOUS CHLORIDE

Epichlorohydrin → ALLYL CHLORIDE

- Epoxy resins
  - Coatings for aluminum cans
  - Household glue for metals, glass, and ceramics
  - Matrix for stained glass windows
  - PC boards, composites
  - Surface coatings on household appliances
- Glycerine
  - Moisturizing compounds
  - Pharmaceuticals
- Polymers
  - Water treatment
  - Wet strength resins

ETHYLENE CHLOROHYDRIN

Cl₂

- DRINKING WATER DISINFECTION
- WASTE AND SEWAGE TREATMENT

METHYL CHLOROACETATE
CHLOROACETIC ACID

- Crop protection chemicals
- Permanent wave solutions and hair care products
- Pharmaceuticals
- Polymer ion exchange resin
- Synthetic caffeine
- Thickeners, food additives
- Vinyl stabilizer

ETHYLENE DICHLORIDE → VINYL CHLORIDE → POLY VINYLCHLORIDE (PVC/Vinyl)

Ethylenediamines

- Additives for oil, detergents
- Paper chemicals
- Softeners

- Adhesive and bonding agent base for synthetic turf
- Automobile vinyl tops, upholstery and floor mats
- Baby bibs, crib bumper pads, and baby strollers
- Bicycle seats and handle bar grips
- Card tables and chairs
- Cases for cosmetics, cameras, binoculars, etc.
- Coating for paper
- Containers for food products, cosmetics, toiletries and household chemicals
- Electrical and decorative vinyl tapes
- Electrical insulation
- Exercise equipment pad coverings
- Fences, decks, trellises
- Film and sheeting
- Floor coverings, molding strips
- Garden hoses
- Golf bags

- Handbags, wallets
- Inflatable boats and water floats
- Luggage
- Magnetic recording tape
- Mattress covers
- Medical blood bags, IV bags and tubing
- Pipes
- Plumbing fittings
- Raincoats, rainsuits and umbrellas
- Roofing material
- School and office supplies
- Seat coverings
- Shoes
- Siding, gutters, and gutter leaf guards
- Solar reflective film
- Swimming pool liner and covers
- Textile coatings
- Wallpaper
- Watch straps, belts
- Window and door frames

PHOSPHORUS TRICHLORIDE
PHOSPHORUS PENTACHLORIDE
PHOSPHORUS OXYCHLORIDE

- Crop protection chemicals
- Fire retarding agents
- Gasoline additives
- Hydraulic fluids
- Semiconductor manufacture

FERRIC CHLORIDE

- Etching and engraving
- Pharmaceuticals
- Photography
- Printed circuitry
- Water treatment

DICHLOROETHYL ETHER

- High grade lubrication oils
- Vinyl ether
- Paints, varnishes and lacquers

METHYLENE CHLORIDE

- Adhesives
- Aerosols
- Paint removers
- Photographic chemicals
- Plastic processing
- Silicones

ZINC CHLORIDE

- Dental cements and dentifrices
- Deodorant preparations
- Soldering fluxes

BENZOYL CHLORIDE
CHLOROTOLUENES
BENZOTRICHLORIDE
PARACHLOROBENZOTRIFLUORIDE

- Cosmetics
- Crop protection chemicals
- Dyes
- Initiators for plastics
- Perfume base
- Pharmaceuticals
- Stabilizers for plastics
- Sunscreen

DICHLOROPHENYL SULFONE ← Polysulfone

- Computer components
- Electronic parts
- Pipe and sheets
- Power tool housings

ETHYL CHLORIDE ← Ethylcellulose

- Coatings
- Inks
- Rocket components
- Time release pharmaceuticals
- Water treatment

METHYL CHLORIDE

- Chlorosilanes → Semi-conductors
- Methylcellulose → Thickening agent for foods and non-foods
- Silicones

1,1,1 TRICHLORETHANE
CHLOROFORM
CARBON TETRACHLORIDE → Intermediates

- Pharmaceuticals
- Refrigerants

- Cosmetics
- Encapsulation of electronic parts
- Medical devices used within the body
- Pharmaceuticals
- Polishes, waxes
- Surgical membranes
- Various home use caulking and sealing compounds
- Water repellent coatings

CALCIUM HYPOCHLORITE

- Algaecide
- Bactericide
- Deodorant
- Disinfectant for swimming pools
- Portable water purification

CHLOROPRENE ← Neoprene

- Carpet backing
- Oil resistant auto components
- Seat cushions
- Shoe soles
- Wire coating

- Automotive components and electrical
- Bullet proof glass
- Compact discs
- Containers
- Household appliance housings
- Windows on buses, trains, subways, aircraft, buildings

PHOSGENE ← Polycarbonate

- Abrasive wheels
- Adhesives
- Auto bumpers and fenders
- Brush bristles
- Foam cushions/mattresses
- Paints and varnishes
- Sealants and caulking agents
- Shoe uppers and heels
- Spandex fibers (exceptional elasticity – used in socks, belts and stretch bands)

PROPYLENE CHLOROHYDRIN → Propylene oxide → Polyurethane

HYDRAZINE

- Blowing agent
- Buoyancy agent for undersea salvage
- Fuel cells
- Pharmaceuticals
- Photographic developers
- Plating metals on glass
- Polymerization catalyst
- Rocket propellant
- Spandex fibers (imparts elasticity to garments such as socks and special hosiery)

- Propylene glycols
  - Antifreeze and coolants
  - Brake fluids
  - Cleansing creams
  - Coatings
  - Cosmetics
  - Crop protection chemicals
  - Flavoring extracts
  - Food additives
  - Lotions/creams
  - Natural gas treatment
  - Paint
  - Pharmaceuticals
  - Plasticizers
  - Plastics
  - Soft drink syrups
  - Solvents
  - Suntan lotions
- Hydroxypropylacrylate → Coatings
- Polypropylene glycols
  - Lubricants
  - Metal working fluids
  - Plastics
  - Rubber
- Propylene glycol ethers
  - Brake fluids
  - Cleaners
  - Coatings
  - Intermediates
  - Mining chemicals
  - Paint
  - Solvents
- Isopropanolamines
  - Adhesives
  - Coatings
  - Corrosion inhibitors
  - Cosmetics/personal care
  - Crop protection chemicals
  - Neutralizing agents
  - Plastics
  - Surfactants
  - Urethanes

Source: Charles River Associates